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Thomas J. Christofk, Air Pollution Control Officer

MEMORANDUM

TO: Board of Directors, Placer County Air Pollution Control District

FROM: Tom Christofk, Air Pollution Control Officer

AGENDA DATE: October 14, 2004

SUBJECT: Roseville Rail Yard Study (Information)

Action Requested:

No action is requested. Placer County Air Pollution Control District (District) Staff will distribute the *Roseville Rail Yard Study* and provide information regarding the findings of a study conducted by the California Air Resources Board (ARB) on potential relative health risks resulting from diesel particulate emissions from the Union Pacific Railroad Company's rail yard located in Roseville.

Background:

The District's primary goal is to achieve and maintain clean air standards, and healthful air quality, throughout Placer County. With the identification of components of diesel particulate matter (DPM) as a toxic air contaminant by the State Air Resources Board (ARB) in 1998, and in response to concerns expressed by some Roseville residents, in 2000, the District sought to determine whether Placer County residents are being adversely impacted by emissions discharged by emission sources located at the Union Pacific Railroad's J. R. Davis Yard, located in Roseville (hereinafter referred to as the Roseville Rail Yard). Lacking the internal resources at that time to conduct an analytical and empirical analysis of the situation, and understanding that the ARB was beginning to evaluate diesel toxic emissions in many categories, the District made a request to the ARB for the conduct of an establishment of emission inventory and an assessment of the health risk posed by Roseville Rail Yard operations upon the surrounding community. The District requested the assessment for the dual purposes of disclosing to the public the potential health impacts of Roseville Rail Yard DPM emissions and of identifying the need for DPM emission reductions. In response, the ARB agreed to work with the District to estimate the exposure associated with diesel particulate emissions from current and future rail yard operations in Roseville.

In the process of determining the exposure of the public to the DPM emissions, there were numerous data exchanges and discussions between the technical staff from the ARB and UPRR. ARB developed an emissions inventory (e.g. the time, location, and quantity of emissions discharged); conducted air dispersion modeling to determine exposure concentrations at nearby receptors; and determined the potential increased risk to public health. At all steps appropriate ARB, U.S. EPA, and California's Office of Health Hazard Assessment (OEHHA) guidelines were followed. The District has been kept informed of the progress of these steps, but has not been involved in the technical aspects of the data interpretation.

The District has focused upon seeking ARB assistance in addressing three "macro" objectives for this assessment:

1. What is the risk to the public being exposed to the emissions from the facility?
2. What does it mean, in comparable terms, to other sources of diesel emissions?
3. What can be done to reduce the emissions, and thereby reduce the risk?

Accordingly, the District's specific objectives for the risk assessment and its presentation are as follows:

Obj. 1: Provide an Accurate Assessment: The assessment should be accurate. If a choice is to be made in assumptions or methodology, the preference of the District is toward including the worst-case scenario with regard to estimating public health impacts. Less health conservative scenarios and approaches are acceptable only for comparison purposes. The uncertainties associated with all assumptions and methods should be disclosed. Whenever possible ARB approved assessment methods should be used.

Obj. 2: Provide Full Disclosure to the Public: The assessment should fully disclose the input data, data sources, assumptions, and methodologies. A purpose of the assessment is to provide the public with factual information on the actual or potential health impacts of yard operations. The District requested this assessment for this purpose. The inclusion of information concerning data uncertainties, error margins, the conservativeness of assumptions, and differing viewpoints, are essential parts of full disclosure.

Obj. 3: Provide a Factual Presentation of the Assessment to the Public: Because of the complex nature of dispersion modeling and risk assessment methods a simplified explanation of the risk assessment process and findings is recognized as being an aid in informing the public. The District does not wish to create unfounded concern, nor does the District wish to provide a bias with regard to the meaning of the assessment to individual members of the public. The objective of the District is to provide as much factual information as is appropriate to inform members of the public regarding the significance of the assessment results to their individual circumstances. Emphasis should be placed upon the conservative nature of modeling and risk assessment and that the intended purpose of such evaluations is to provide comparative risk information for populations. The risk assessment results are not intended to accurately state risks to individuals. The risk

assessment information should be placed within a comparative context to other sources of like emissions.

Obj. 4: Identify Mitigation Measures for Risk Reduction: As indicated in the background information, another purpose of the District's requesting the assessment was to identify whether yard emissions were such that reductions in risk, usually to be achieved through reductions in emissions, were warranted. For the determination of significance the use of normalized (approved) assessment methods and results are required. The use of the assessment model to determine appropriate and effective mitigation strategies to reduce risk is a desirable methodology. In order to identify mitigation measures, the assessment should identify the sources of diesel particulate emissions so that separate sources can be evaluated for risk reduction feasibility.

Obj. 5: Develop and Implement a Risk Reduction Plan: Reducing emissions will ultimately reduce the level of exposure and risk to the public from diesel exhaust. Some reductions in emissions have already been implemented by actions taken by UPRR, and others will occur as Federal engine and fuel standards take effect over time. A Risk Reduction Plan should be created with short, mid, and long-term strategies identified and then implemented to effect quantifiable emissions reductions.

Obj. 6: Follow-up the Analytical Assessment with an Air Monitoring Program: Developing an air monitoring "protocol" and program to follow in release of the risk assessment results would allow for actual air pollutant concentrations to be measured, providing a check on the validity of the modeling (anticipated to be conservative) and also would provide empirical information concerning risk reduction measures. It is recognized that there are inherent inaccuracies and concerns in developing and conducting air monitoring that would need to be resolved (issues such as air pollutant speciation and "background" clutter), and an effort to define these parameters and solve the technical difficulties should be undertaken, along with identification of the resources to implement such a program.

Since the conduct of the study to assess the chronic health risks from diesel particulate emissions was first authorized in April 2000, the Air Resources Board staff has worked, based on UPRR operations data for the period of November 1999 through November 2000, to quantify the emissions from the Roseville Rail Yard and determine the relative chronic (cancer) health risks. ARB staff also sought to place the risk results in context by providing a comparison to other chronic health risks from diesel emissions sources, to background air toxic health risks, and to the health risk from all sources, all using the same 70-year exposure timeframes. Accordingly, ARB has addressed in the study the first two of the District's "macro" objectives: *"What is the risk to the public being exposed to the emissions from the facility?"* and *"What does it mean, in comparable terms, to other sources of diesel emissions?"*.

The primary focus of District Staff efforts in the intervening period since ARB's work on the study commenced has been the third and last "Macro" objective of *"What can be done to reduce the emissions, and thereby reduce the risk?"*. In pursuing this objective the District Staff have had numerous discussions with UPRR concerning what the company could do to reduce the diesel emissions at the Roseville Rail Yard. In these discussions UPRR has

identified the actions that it has proactively taken system-wide that result in an emissions reductions, including reductions at the Roseville Rail Yard. The District has identified, and discussed with UPRR, changes in operations, equipment, and capital/facility, as well as the installation of emission control devices, that should be evaluated for feasibility. Although UPRR is willing to state that they have a commitment to achieving emission reductions and reducing risk, no binding commitment that specifies emission reduction targets over time has been agreed upon.

Discussion:

What is the risk to the public being exposed to emissions from this facility?

The District anticipates that the report will indicate an elevated risk impacting a large area around the Roseville Rail Yard due to the amount of diesel particulate matter emitted. Specific details of the report will be presented at the Board of Directors meeting by Daniel E. Donohoue, Chief, Emissions Assessment Branch at the California Air Resources Board.

What does it mean, in comparable terms, to other sources of diesel emissions?

While it is likely that the ARB study will show that there is an increase in cancer risk to the public from locomotive diesel exhaust particulate emissions from the Roseville Rail Yard, the magnitude of the risk, the general location of the risk, and size of the area impacted varies by a number of factors. This increase in chronic cancer risk can only be evaluated by comparison to other comparable sources of risk, because the risk values have meaning only in the context of a comparison to risks evaluated in the same manner. The increased cancer values, per 1 million persons exposed, do not denote actual risk because no persons are exposed to the extent that the model requires for the results to be a “prediction”. Instead, the results of the dispersion modeling and risk assessment give a “relative” risk value that can be used for comparison purposes. For example, according to ARB data:

- Estimated background cancer risks from toxic air contaminants
 - Statewide (750 chances in a million),
 - Sacramento area (520 chances in a million)
 - Some portions of the Los Angeles area (more than 1,000 in a million)
- Other diesel particulate emission sources:
 - Back-up generators (100 chances in a million)
 - Distribution centers (750 chances in a million)
 - I-80 in Roseville (50-100 chances in a million)
- The overall lifetime cancer expectancy rate from all causes of 200,000 to 250,000 per million persons (1 in every four or five).

There are different ways to view Roseville Rail Yard chronic cancer risks, if they are in the ranges given in the preliminary drafts reviewed by Staff. One perspective is that when compared to the overall cancer risk of 200,000 to 250,000 per million persons (e.g., one in four or five), even an increased in cancer cases per million of 500 represents a small relative

increase (e.g., 1 in 2000). Another perspective is that if an effort is not made to reduce the risk from individual contributors to the overall cancer risk, where that is possible, the overall risk of cancer will not only remain at up to one-quarter of the population, but will increase.

Due to the inherent uncertainties in risk assessment methods in general, and to the application of these methods to the Roseville Rail Yard in particular, the study results should not be used to draw conclusions about the risk to specific individuals at a specific location. The risk assessment results are best used to compare the relative risks of one facility to another, and in evaluating the effectiveness of one emission control strategy (i.e., a risk reduction strategy) versus another strategy. Accordingly, District Staff agreed with the ARB's presentation of the study results primarily in terms of increased cancer risks that are a result from a conservative 70 year, 7 days a week, 24 hours per day, exposures that can be compared to other common risks for decision making and control measure evaluation purposes. This methodology is in contrast to developing results that may be more applicable to assessing the increased risk to individuals. The increase in risk due to actual exposures will be different for each person exposed, and the effort to provide the means to assess an individual's risk would not further the District's objective of assessing the magnitude of the risks posed in comparison to other risk factors, nor in determining whether one control measure was to be favored over another.

The ARB study has focused on assessing chronic cancer risk from diesel particulate exhaust, an identified California Air Toxic Contaminant. This is in keeping with the District's original request. Since the initiation of the study in 2000 the ARB and others have released health information that correlate acute health impacts associated with exposure to air pollution in general and particulate matter specifically.

The Department of Preventive Medicine at University of Southern California recently published in the New England Journal of Medicine the results of an eight-year study titled The Effect of Air Pollution on Lung Development from 10 to 18 Years of Age. The study focused on the exposure of air pollution on lung development in children in Southern California communities with varying levels of air pollution. The results of this study indicate that when children are exposed to higher levels of ambient air pollution, reduced lung development occurs when compared to children who are exposed to lower levels of air pollution.

The results of another study of the health effects from particulate matter found that the hearts of sensitive individuals may be affected when they breathe in fine particulate matter. Individuals with an existing cardiac disease can be in a potentially life-threatening situation when exposed to high-levels of ultrafine particulate air pollution. Fine particles can penetrate the lungs and may cause the heart to beat irregularly or can cause inflammation, which could lead to a heart attack.

These studies suggest that there is potential for some acute health effects due to concentrations of air emissions from the Roseville Rail Yard. These acute health effects,

which were not the focus of the ARB study, would need to be examined in order to assess the overall health implications of the Roseville Rail Yard's emissions.

What can be done to reduce the emissions, and thereby reduce the risk?

This section discusses existing and proposed federal and state regulations that will result in diesel engine emission reductions overall, as well as those targeted specifically at locomotive emissions. Reducing emissions will ultimately reduce the level of exposure concentrations and the risks that results from diesel PM emissions from the yard and from the "background". A key element in achieving emissions reductions will be the quality of the diesel fuel, in particular the sulfur content, and for this reason both current and future fuel standards are described in some detail. This section also discusses potential measures that might be employed to reduce localized emissions from Roseville Rail Yard operations. Because emission reductions are most often attained through technology advancements or other means that are costly to implement, the emission reduction measures are often achieved only through mandates established by regulatory authorities. Often these mandates are implemented in phases to soften the economic cost. When locomotive emission standards are set they often do not apply to the current locomotive fleet, but target new equipment being manufactured, enabling the older locomotives to be replaced or retrofitted after a return on the initial investment.

Regulation of locomotives is a legally complex, multi-layered matter involving federal, state, and local regulation. Some areas of regulation are reserved exclusively to the federal government, and some areas of regulation are reserved exclusively to the state, with local air districts having regulatory authority in more limited areas.

Federal & State Diesel Fuel Sulfur Content Standards

The sulfur content of diesel fuel has a substantial effect on particulate matter emission rates from diesel engines and influences what type of after market emission control equipment can be installed on an engine. Removing the sulfur requires added steps in the refining process, and thus adds cost. Sulfur also provides some lubricity function, but this can be achieved through other measures. In essence, the lower the sulfur content, the lower the particulate matter emissions. Studies that have been conducted on both in-use two and four stroke diesel engines have shown that significant particulate matter reductions can be achieved by simply switching to low sulfur fuel, without the need for additional exhaust traps and with no negative operational or performance indications. A study prepared for ARB by Southwest Research Institute in 2000 found a nearly linear relationship of approximately 0.001-0.002 g/hp-hr reductions in PM for every 100 ppm drop in sulfur content. The study tested sulfur levels at several points over the range between a 4760 ppm non-road high sulfur fuel and a 50 ppm low sulfur fuel. Thus, for a typical locomotive engine at the rail yard, this would be result in a 10% reduction in diesel PM emissions by switching to low sulfur fuel.

- *Existing federal diesel fuel sulfur content regulations. (EPA Diesel)*

- Existing federal standards allow the content of sulfur in diesel fuel to range from 330 ppm for on-road motor vehicle applications to upwards of 4000 ppm for locomotives and marine engines. The new diesel fuel sulfur content standard discussed below will enable the use of after market emission control technologies that require low sulfur fuel to operate.
 - The EPA adopted rules in 2001 that require diesel fuel refiners to reduce the sulfur content in diesel fuel used in on-road mobile applications to 15 ppm (97 % reduction) by June 1, 2006. Additional rules require off-road diesel fuel sulfur content for use in industrial, construction, agricultural and mining operations to be reduced to 15 ppm (99 % reduction), by 2010.
 - The EPA has also adopted rules to reduce the sulfur content of diesel fuel used in locomotives and marine applications to 500 ppm by June 1, 2007 and 15 ppm by June 1, 2012.
- *Existing State diesel fuel sulfur content regulations. (CARB Diesel)* Since 1993, an ARB regulation has limited the allowable sulfur content of motor vehicle diesel fuel to 500 ppm statewide. In order to comply with the federal low sulfur limit for diesel fuel adopted in 2001, the ARB approved an amendment to the California Diesel Fuel Regulations to further reduce sulfur in diesel fuel from 500 ppm to 15 ppm starting in mid-2006. At this time, most CARB Diesel available statewide contains between 120-140 ppm sulfur.
 - *Proposed State diesel fuel sulfur content regulations.* The State of California is currently proposing the adoption of an Airborne Toxic Control Measure that would extend the applicability of the California standards for motor vehicle diesel fuel regulations to diesel fuel used in commercial and recreational harborcraft and intrastate diesel diesel-electric locomotives. If adopted, this rule would apply to all intrastate locomotives operating at least 90 percent of the time within the borders of California and require them to use ultra low sulfur fuel (15 ppm sulfur content).

Federal Rules Effecting Locomotive Emission Standards

- *Adopted Emission Standards for Locomotives.* Most locomotives in the U.S. are powered by diesel engines. These locomotives contribute to significant NOx emissions, as well as HC and PM emissions, all of which have significant health and environmental effects. Based on requirements of the 1990 Clean Air Act Amendments, the U.S. EPA promulgated exhaust emissions standards of NOx, HC, CO, and PM for newly manufactured and remanufactured locomotives and locomotive engines in 1998. These emission standards went into effect in 2000 and affect railroads, locomotive manufacturers, and locomotive re-manufacturers.

Three separate sets of emissions standards have been adopted, with applicability of the standards dependent on the date a locomotive is first manufactured.

- The Tier 0 standards apply to locomotives and locomotive engines originally manufactured from 1973 through 2001.

- The Tier 1 standards apply to locomotives and locomotive engines originally manufactured from 2002 through 2004.
- The Tier 2 standards apply to locomotives and locomotive engines originally manufactured in 2005 and later.

Electric locomotives, historic steam-powered locomotives, and locomotives originally manufactured before 1973 are exempted from these federal emission standards.

The primary focus of these emission standards is on reducing NO_x and PM emissions. U.S. EPA estimates NO_x emissions from locomotives will be reduced 45 percent by 2010 and 60 percent by 2040, compared to 1995 baseline levels. This reduction would be almost 650,000 metric tons of NO_x per year nation-wide. A PM reduction of 46 percent is expected by 2040, compared to 1995 baseline levels. This PM reduction would be over 12000 metric tons per year nation wide, and amounts to over one percent of national PM emissions from mobile sources. It should be emphasized that these reductions are estimates nationwide, and the actual reductions realized at the Roseville Rail Yard cannot be determined at this time.

- *Proposed Rulemaking for Locomotive and Marine Engine Emission Standards.* In May 2004, EPA announced its intent to propose more stringent emission standards for new and existing locomotives and new marine diesel engines. The emission reductions would be achieved through catalytic after-treatment devices that can be used once the diesel sulfur levels are reduced to 15 ppm. EPA recognizes that “locomotive and marine diesel engines produced today are required to meet relatively modest emission standards. This means that they continue to emit large amounts of nitrogen oxides and particulate matter, which contribute to serious public health problems.” The proposed emission standards could apply as early as 2011. ARB and local air districts, including Placer County APCD, have recently commented on this proposed rule and encouraged EPA to adopt stricter standards and an earlier phase-in then was proposed in the draft regulations.

State Rules Effecting Locomotive Emission Standards

- As indicated earlier, the State of California is currently proposing the adoption of an Airborne Toxic Control Measure that would set sulfur content fuel standards for intrastate diesel diesel-electric locomotives.

Additional Options to Reduce Roseville Rail Yard DPM Emissions

- Apply current available and emerging emission-control technology and devices to locomotive diesel engines. These include such things as: systems to curtail unnecessary idling; auxiliary power units that reduce the need for running the main engine in certain applications; diesel particulate filters, “traps”, and catalysts that treat the exhaust stream and reduce the DPM and other emissions; and reduction of lube oil blow-by and other crankcase control improvements.

- Install stationary air pollution control equipment to control emissions from the repairing/testing facility. This maybe a viable option because the locomotives are brought to this area to undergo testing and/or be repaired. It is conceivable that an air handling system could be designed to capture the emissions from these staged and “captive” locomotives while in this area, either through “hoods” or other systems and then controlled through a control device such as a Wet Electrostatic Precipitator or a Venturi Scrubber.
- Accelerate replacement of older yard locomotives with new Tier 2 standard locomotives or employing new hybrid electric or other lower emission switchers. Accelerate the introduction of low sulfur fuel ahead of regulatory time lines and investigate and implement (if feasible) the use of other fuel blends that are on the market that have the potential to reduce emissions.

Existing Regulations / Strategies to Reduce Background Health Risks From DPM

As was indicated earlier, the background chronic cancer risk in our Sacramento region from all toxic air contaminants is estimated to be 520 chances in a million, of which diesel particulate matter accounts for almost 70% (or 360 in a million). These risks are additive to the risks associated with the rail yard, and therefore it is important to keep in mind those programs and regulations that are designed to reduce the overall background toxics concentrations, as well as those specifically targeted to locomotives and the rail yard. A brief synopsis of these regulations and their implementation timelines follows.

- *Heavy Duty Engine & Vehicle Standards & Highway Diesel Fuel Sulfur Control.* The EPA has established a comprehensive national control program that will regulate the heavy-duty on-road vehicle and its fuel as a single system. As part of this program, new emission standards will begin to take effect in model year 2007 and will apply to heavy-duty on-road highway engines and vehicles. These standards are based on the use of high-efficiency catalytic exhaust emission control devices or comparably effective advanced technologies, and will require the use of the low sulfur diesel fuel that is being introduced via the federal regulations (previously discussed) in mid 2006.
- *Clean Air Nonroad Diesel Rule.* EPA’s Clean Air Nonroad Diesel Rule requires stringent pollution controls on diesel engines used in industries such as construction, agriculture and mining. These new engine standards begin to take effect in 2008 depending on the engines horsepower. As previously noted, the sulfur content of off-road diesel fuel will be reduced to 15 ppm in 2010 which will enable engine manufacturers to use advanced technologies to achieve the emissions reductions.
- *California Diesel Risk Reduction Plan.* Following an exhaustive 10-year scientific assessment process that identified particulate matter from diesel-fueled engines as a toxic air contaminant, the ARB in October 2000 adopted a comprehensive Diesel

Risk Reduction Plan (RRP) for all on-road, off-road, and stationary diesel-fueled engines and vehicles (excluding locomotive diesel engines). The intent of the RRP is to significantly reduce diesel PM emissions and associated toxic air contaminants (TACs) throughout the State. The basic premise behind this risk reduction plan is simple: to require all new diesel-fueled vehicles and engines to use state-of-the-art catalyzed diesel particulate filters (DPFs) and very low-sulfur diesel fuel. Further, all existing diesel-fueled vehicles and engines should be evaluated, and wherever technically feasible and cost-effective, retrofitted with DPFs.

The Diesel Risk Reduction Plan includes the following three components:

- New regulatory standards for all new on-road, and stationary diesel-fueled engines and vehicle to reduce DPM emissions by about 90 percent overall from current levels;
- New retrofit requirements for existing on-road, off-road, and stationary diesel-fueled engines and vehicles where determined to be technically feasible and cost-effective;
- New phase 2 diesel fuel regulations to reduce the sulfur content levels of diesel fuel to no more than 15 ppm to provide the quality of diesel fuel needed by the advanced diesel PM emission controls.

ARB expects full implementation of this plan to substantially reduce DPM emissions and associated cancer risks by 75 percent in 2010 and by 85 percent in 2020.

Current Situation:

Completed Objectives

The District's objectives in requesting the ARB to conduct a risk assessment for diesel particulate emissions from the Roseville Rail Yard, fully defined in the Background section of this memorandum, included the following that will have been largely achieved with the release of the ARB study:

Provide an Accurate Assessment: District Staff believe that the State Air Resources Board will have produced an objective study, using accepted methodology, which fully discloses the uncertainties with regard to assumptions. District Staff believe that the assessment will be an accurate representation of the relative theoretical chronic risk, expressed in terms of increased cancer cases per million persons exposed, that may be used in comparison to similar sources of risk and for the assessment or risk reduction strategies. The study will not predict the actual risks to individuals, and was not intended to do so.

Provide Full Disclosure to the Public: The ARB study will fully disclose the input data, data sources, assumptions, and methodologies. The study will include information on data uncertainties, the sensitivity of the output to changes in the input data, and the basis for assumptions. Where input data was disputed, with respect meteorological data sources and dispersion coefficients, the ARB will provide the range of results from the input data. The

District Staff believe that the study will provide the public with factual information on the potential health impacts of yard operations, with respect to relative chronic health risks.

Provide a Factual Presentation of the Assessment to the Public: District Staff have worked with UPRR, ARB, and the City of Roseville, and the District obtained the services of public outreach consultant, in preparation for the release of the study, to improve the means by which the public could be informed about the study and its results. The District intends to make the entirety of the study available on the District website, and has scheduled public meetings to disseminate the study and receive public comment. In this effort, the District continues to have the objective of not wishing to create unfounded concern, nor interpret the study for individual members of the public. The objective of the District is to provide as much factual information as is appropriate to inform members of the public regarding the significance of the assessment results to their individual circumstances. Emphasis should continue to be placed upon the conservative nature of modeling and risk assessment and that the intended purpose of such evaluations is to provide comparative risk information for populations in order to compare the relative risks to risks of other like emission sources. The risk assessment results are not intended to, and do not, predict risks to individuals.

Identify Mitigation Measures for Risk Reduction: District Staff believe that reductions in Roseville Rail Yard emissions could significantly reduce the potential chronic risk in surrounding communities. Attachment 1 outlines some diesel particulate emission reduction strategies that can be employed to reduce emissions from Roseville Rail Yard operations, in addition to programs and regulations already proposed by ARB and U.S. EPA. The District can utilize computer based modeling to compare the effects and effectiveness of different emission reduction strategies.

Objectives Not Completed

The District has established the following objectives that have not been completed:

Develop and Implement a Risk Reduction Plan: Reducing emissions will ultimately reduce the level of exposure and risk to the public from diesel exhaust. The development of a Risk Reduction Plan to obtain quantifiable emissions reductions remains as an objective that has not been completed.

UPRR has indicated a commitment to reducing emissions and the associated risk, but the company, as of the writing of this memorandum, has not agreed to establish binding risk reduction targets. Discussions are still on-going. The District remains willing to work with UPRR to identify potential risk reduction measures and to promote their implementation. In addition, the District will support the promulgation of new and revised federal and state mandates that cause a reduction in health risks from diesel particulate emissions on a nationwide or statewide basis.

Follow-up the Analytical Assessment with an Air Monitoring Program: Since the study will have been provided to the District, it is appropriate to focus on undertaking an air monitoring program. District Staff have identified the need for a consultant to aid the

District in developing the air monitoring protocol to allow for actual air pollutant concentrations to be measured, providing a check on the validity of the modeling and eventually to provide empirical information concerning the effectiveness of risk reduction measures.

In addition, the District Staff have identified the new and additional objective of characterizing the potential acute health effects from Roseville Rail Yard emissions

Next Steps:

Staff is prepared to undertake the following course of action as a result of the release of the risk assessment study:

- *Inform the public of the information contained in the study:* A Communications and Public Outreach Working Group has been formed consisting of representatives from the District, Sacramento Metro AQMD, ARB, UPRR, City of Roseville, and Placer County. This group is planning on conducting several public meetings to provide the study results, and has developed public information products identifying ways for interested citizens to obtain more information and to be kept apprised of updates.
- *Initiate an Air Monitoring Program:* With the authorization sought today for the Melvin D. Zeldin consultant services contract, the District has taken the first step in defining and addressing the technical issues involved in conducting air monitoring to determine actual particulate concentrations in the vicinity of the Roseville Rail Yard. The District has already acquired two (2) BAM air monitors that are to be used in this monitoring project. Staff has asked ARB to provide support in this area, recognizing the limitations in the current ability to monitor specifically for diesel particulate matter, and has also requested resources and support from UPRR.
- *Follow-up with acute health effects analysis:* Staff is seeking to have a scholarly review conducted of the ARB study on a priority basis with the objective of characterizing the potential acute health effects from the diesel particulate matter emissions from the rail yard. Staff will provide the results of a review to the Board and the public when it becomes available.
- *Identify risk reduction alternatives:* While the District is preempted by federal and state law from certain regulatory actions, other actions appear to be within the District's authority. The extent of the District authority and the findings of the ARB's risk assessment are both considerations in selecting the strategies to reduce Roseville Rail Yard emissions. Other factors to be considered include the emerging issues of potential acute health impacts due to rail yard emissions, the extent of voluntary measures implemented or to be implemented by UPRR, and

the timing and the extent of emission reductions from existing and proposed federal and state regulations.

Staff will outline at a future Board meeting options and strategies to secure Roseville Rail Yard emission reductions, thereby reducing health risks, and seek guidance and direction. Among these strategies are likely to be:

- Incentives for reductions (public funds/market-based)
- UPRR voluntary measures or commitments
- Potential regulatory actions
- Enforcement
- Rulemaking options
- Legislation

Attachment: #1 Potential Diesel Particulate Matter Reduction Strategies

Enclosure: Roseville Rail Yard Study (to be handed out at the Board of Director meeting)

ATTACHMENT #1

ATTACHMENT #1

Potential Locomotive Diesel Particulate Matter Reduction Strategies		
Strategy/Technology	Description of Technology	Current / Possible Control Measures
Idling Control	Reducing idling emissions when locomotives are in repairing facility, testing areas, or loading/preparing tracks	<ul style="list-style-type: none"> · Smart start system* · Auxiliary power system · Training for engineer
Clean Diesel/Alternative Fuel	Using alternative diesel fuel	<ul style="list-style-type: none"> · Ultra-low-sulfur diesel · Emulsified diesel · Bio-diesel · Ethanol diesel
After Combustion Treatment	Installing treatment equipment on locomotives to control/reduce the diesel exhaust	<ul style="list-style-type: none"> · Flow through filter · Diesel oxidation catalysts · CRT particulate filter · Crankcase emission control · Diesel particulate filters
Technology for Diesel Engine Design Improvement	Adjusting various parameters in the engines; Improving/modifying diesel engine design to reduce the emissions	<ul style="list-style-type: none"> · In-Cylinder combustion modification · Oil lubricating system improvement · Fuel delivery modification · Advanced timing
Efficiency Improvement for Yard Operation	Operating more efficient to reduce the preparing/moving/reclassing period and fuel consumption	<ul style="list-style-type: none"> · Advanced yard operation system · Effective train handling/dispatching* · Rail track lubricating
Available Diesel Retrofit Technology	A voluntary process for current diesel retrofit technologies verified by EPA	<ul style="list-style-type: none"> · EPA Voluntary Diesel Retrofit program · EPA Environmental Verification Technology
Treatment Options for Repairing/Testing Facility	Installing hood/collection equipment to control the locomotive exhaust when testing/repairing	<ul style="list-style-type: none"> · Air handling system to capture exhaust from idling/testing locomotives · Venturi scrubber · Wet electronstatic precipitators (ESP)
New Engine Emission Standards	Current federal locomotive emissions standards for new/remanufactured locomotives	federal locomotive emissions standards adopted in 2000; Tier 0**, Tier 1, and Tier 2 standards for switch and line-haul duty-cycle
Regulations	Current federal and state regulations to reduce the diesel PM emissions from locomotives	<ul style="list-style-type: none"> · EPA Clean Diesel Truck/Bus and Low-Sulfur Diesel Rule · EPA Clean Nonroad Diesel Fuel Rule · California Diesel Risk Reduction Plan
Alternative Options/Incentives/Clean Air Funds	Contributing resources to reduce onsite unregulated emissions	<ul style="list-style-type: none"> · The District Offsite Mitigation Program · Clean Air Grant · EPA Diesel Retrofit Fund · Carl Moyer Fund

* The measures have been applied at Roseville Rail Yard.

** Some locomotives at the yard have been remanufactured to meet Tier 0 emission standards